

What you should know
about

HANDSAWS

Which saw is the best for my purpose?

What features should I look for in a saw?

How should a saw be sharpened and how often?

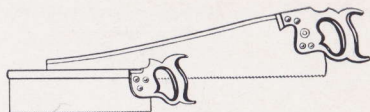
What is "cross-sharpening"?

How is a tenon saw sharpened?

How should I set my saws?

These questions and many more are answered.

A SANDERSON SHEFFIELD PUBLICATION





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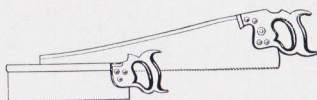
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about
HANDSAWS



A **SANDERSON** SHEFFIELD
PUBLICATION

Blade fits snugly into slot
in handle.

Handle of selected beech, well finished and
shaped for comfortable grip and fitted to
give correct balance.

Blade of high grade
alloy steel tempered for
toughness and wear resis-
tance. Good surface finish.
Taper ground, i.e. dimi-
nishes in thickness
towards back and point.

Heel or butt.

Points per
inch shown
here.

Trade mark with
maker's guarantee
clearly etched.

Back. Saw
illustrated is
skewback type.

Toe.

If a rip saw, will have
diminishing size of
tooth towards toe.

Breasted blade.
Edge is slightly convex.

If for cross-cutting, teeth will be
fully cross-sharpened.

If for ripping, will be sharpened
straight through with chisel-
shaped teeth.

Fig. 1. Handsaw nomenclature and characteristics of a high grade craftsman's saw.

What you should know about **HANDSAWS**

The highest grade saw

The features of a high grade handsaw are illustrated in Fig. 1. This saw is scientifically designed to cut wood with minimum effort and, with reasonable care, will give its user many years of satisfactory service working day in and day out.

It includes all the refinements that an experienced manufacturer can put into a tool.

Do you need such a saw ?

If you want the very best in saws to help you in your trade, this is the saw for you. Likewise, if you are a keen amateur who looks after his tools and you are prepared to pay a little extra for them, then this—or one approaching it—is your saw. But if all you want from a saw is occasional service, a sufficiently good tool for a bit of carpentry and the odd job about the house, you should go for something less expensive.

The best manufacturers make moderately priced saws suitable for the householder, farmer and general tradesman. These saws are reliable, if not quite as efficient, as the high grade craftsman's saw in Fig. 1. Later in this book we say more about the difference between the highest grade and other saws. Whatever saw you decide on, this diagram will give you a standard by which to judge saws.

MAINTAINING YOUR SAW

Maintaining a saw in good condition is not difficult if you bear in mind the need for regular attention. This does not mean that a high grade saw needs frequent re-sharpening. In the saw illustrated in Fig. 1 — Sanderson's "PAX" — the steel is highly resistant to wear without being brittle. Frequent re-sharpening is not required, even if the craftsman uses his saw every day. Nevertheless, some attention is necessary to maintain the saw in good working condition.

The teeth will need a light filing from time to time to keep them cutting efficiently. The method of filing is dealt with on pages 14 to 17. Similarly with the medium price saw, depending on how much you use it. Every now and then inspect the teeth and file, if necessary.

Protection from damage

In addition to filing when the need occurs, the user should try to protect his saw from unnecessary damage.

Inspect timber for hidden nails or bolts before making a cut.

Do not flex or bend the saw in the cut in an attempt to break off a partly sawn piece, or you may damage the teeth and buckle the saw.

When you have finished the day's work, do not throw the saw into a drawer along with other tools. This may cause breakage of teeth or handle. Hang the saw up in a dry place and, if possible, give it a smearing of acid-free grease or oil to prevent rusting. A rusty saw is an inefficient saw. Once rusting starts, it is not easy to stop as rust soon bites deeply into a blade and the pits are difficult to remove.

If you carry the saw in a tool bag, cut a slot in a piece of wood the length of the saw blade and fit this over the teeth to protect them.

SERVICING YOUR SAW

Even if you file-sharpen your saw regularly, there will come a time when a rather more complicated servicing will be necessary. This is described below.

The four operations are *topping*, *shaping*, *setting* and *sharpening*.

Topping. Topping is necessary to correct the height of the teeth which usually wear irregularly. (Fig. 2.)

Place the saw in a saw vice or, alternatively, clamp it into a woodworker's vice or steel vice with wood packing to protect the blade. The teeth should be upwards, projecting about $\frac{1}{4}$ in. above the vice jaws.



Fig. 2. Saw needs topping.

Now look closely at the teeth from the side and, taking a 10 in. millsaw file (Fig. 3a) or smooth flat file, draw this over the teeth to bring them all to the same height. Try to hold the file flat and steady as you do this, and file along the length of the saw.

If some teeth are much lower than others, do not attempt to finish the topping all at once but carry on with the next operation—shaping.

Shaping. For shaping, fix the saw in the vice so that the teeth gullets can just be seen above the vice jaws.

Select a suitable size of taper saw file or double-ended saw file (Fig. 3) for the tooth pitch:—

4 points per inch – 7" taper saw file.

$4\frac{1}{2}$ points per inch – 6" taper saw file or 10" double-ended saw file.

5 points per inch – 6" taper saw file, 8" slim taper saw file or 10" double-ended saw file.

6 points per inch – 5" taper saw file, 7" slim taper saw file or 10" double-ended saw file.

7 points per inch – $4\frac{1}{2}$ " taper saw file, 7" slim taper saw file or 9" double-ended saw file.

8 points per inch – 4" taper saw file, 6" slim taper saw file or 8" double-ended saw file.

10 points per inch – $3\frac{1}{2}$ " taper saw file, 5" slim taper saw file or 7" double-ended saw file.

11 points per inch – 3" taper saw file, $4\frac{1}{2}$ " slim taper saw file or 6" double-ended saw file.

12 points per inch – 3" taper saw file, $4\frac{1}{2}$ " slim taper saw file, 5" extra slim taper saw file, or 6" double-ended saw file.

Shape the teeth by filing straight through in the teeth gullets. The file must be held at a right angle to the blade of the saw and parallel to the floor.

You will be wise to follow the *same shape of tooth as originally produced by the makers* as the angles are important and vary according to whether the saw is for cross-cutting or ripping. (Fig. 4a and b.)

Fig. 4(a).
Cross-cut teeth
showing angles.

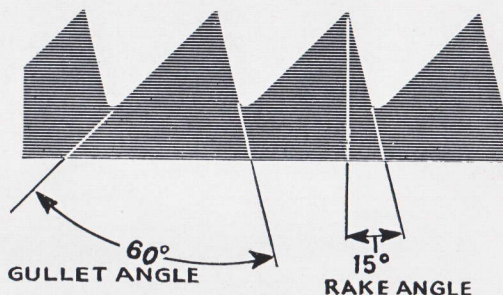
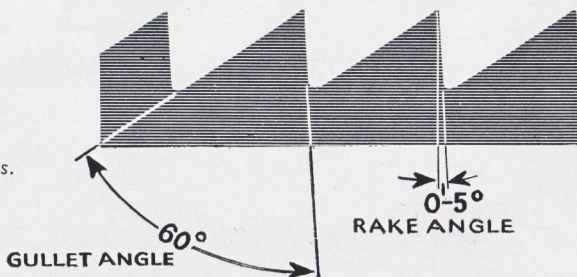


Fig. 4(b).
Ripsaw teeth
showing angles.



After you have filed the gullets, taking care to bring them all to an even depth, examine the teeth for height. If the points are still uneven, return to topping, then shape again.

In a badly worn saw, several alternations of topping and shaping may be necessary before all teeth are brought to the same *height* and *shape*.



(a) Millsaw file.



(b) Taper saw file.



(c) Slim taper saw file.



(d) Extra slim taper saw file.

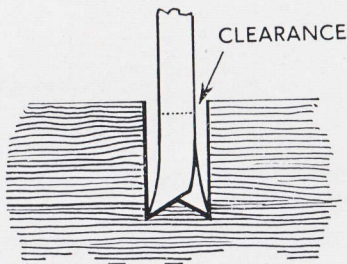


(e) Double-ended saw file.

Fig. 3. Files used in servicing handsaws. The millsaw file (a) is for topping. Alternatively, a worn, smooth cut flat file may be used. The taper saw files superficially resemble a three square engineer's file, but unlike that file, they are cut on the edges as well as on the sides. This helps to give a rounded bottom to the gullet.

Setting. The saw as originally sent out by the manufacturer would have the teeth set; that is, they would be bent, fractionally, one left, the next right, alternately all along the blade of the saw. The purpose of set is to provide clearance in the cut.

Fig. 5. Illustrating how setting provides clearance in the cut (cross-cut tooth is illustrated).



In a high class saw such as the PAX, very little set is necessary. The way in which the saw blade is ground (thinner towards the back and point) aids clearance. (Fig. 6.)

The setting of a saw requires a certain amount of skill and care, whether it is done by hand or by means of a saw set. For those not accustomed to hand setting, the use of a good saw set is advised.

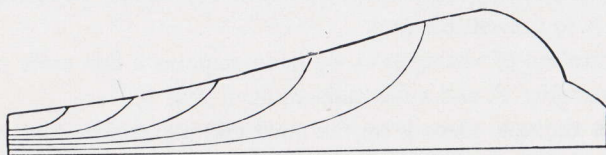


Fig. 6. Showing the method of taper grinding the blade by the manufacturer.

The best type of saw set is the one which superficially resembles a pair of pliers (Fig. 7). The head contains a rotatable anvil and a plunger. To adjust for use, a thumb screw is turned until the appropriate number on the anvil is brought into line with the hammer. This allows for the correct travel of the hammer

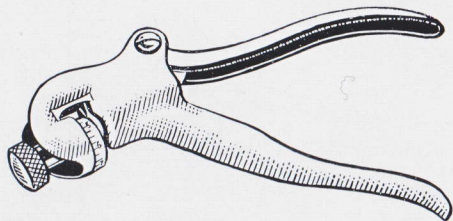


Fig. 7. Saw Set.

to give the amount of set desired. The saw blade is then positioned against locating lugs with the tip of the tooth opposite the hammer. The handles are compressed until the blade is held firmly in position, then further pressure applied to set the tooth.

Necessary precautions when using a saw set of this kind are: do not wrench or move the saw set when applying pressure to set the tooth; never set a tooth in the opposite direction to

Special note

The instruction regarding increase of set for cutting wet green timbers applies to our British and Crown quality handsaws only.

Never increase the set on Pax first quality handsaws or teeth may be broken.

Hand-setting by an expert is preferred for first quality saws.

The best type of saw set is the one which superficially resembles a pair of pliers (Fig. 7). The head contains a rotatable anvil and a plunger. To adjust for use, a thumb screw is turned until the appropriate number on the anvil is brought into line with the hammer. This allows for the correct travel of the hammer

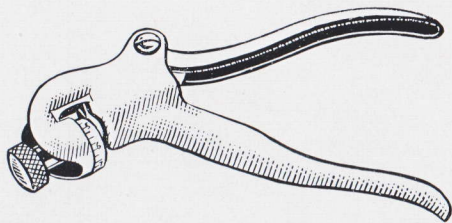


Fig. 7. Saw Set.

to give the amount of set desired. The saw blade is then positioned against locating lugs with the tip of the tooth opposite the hammer. The handles are compressed until the blade is held firmly in position, then further pressure applied to set the tooth.

Necessary precautions when using a saw set of this kind are: do not wrench or move the saw set when applying pressure to set the tooth; never set a tooth in the opposite direction to which it was set originally.

For cutting wet green timbers the amount of set may be increased slightly to prevent binding.

The method of setting saws by hand requires a fine cross pean hammer (Fig. 8) and a saw stake or anvil (Fig. 9).

To set the saw, place it on the anvil and adjust the stops until the teeth project the required amount over the bevelled edge of the anvil.

Then, holding the saw firmly on the anvil, tap each alternate tooth lightly, bending it over into contact with the flanged part of the anvil. (Fig. 10.)

Move the saw along from time to time until each alternate tooth has been set, then turn it over and set the remainder of the teeth.

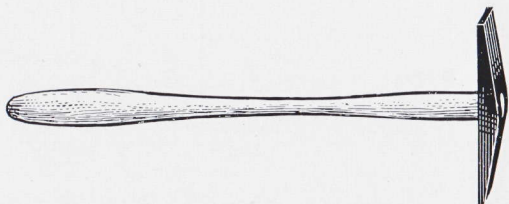


Fig. 8.

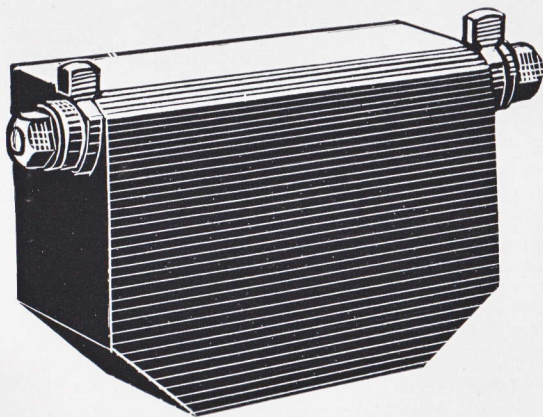


Fig. 9.

Fig. 10. Saw in position on saw stake for setting.

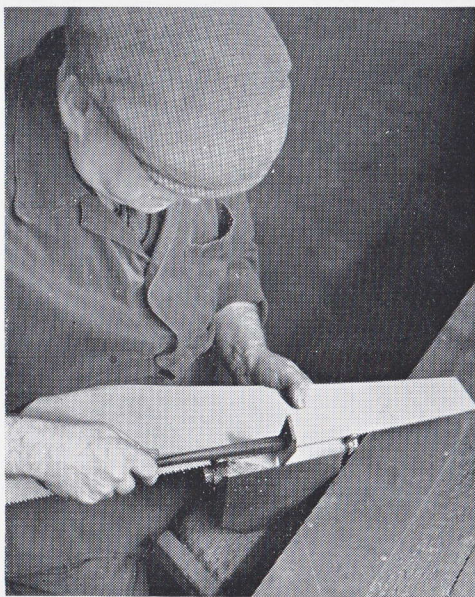
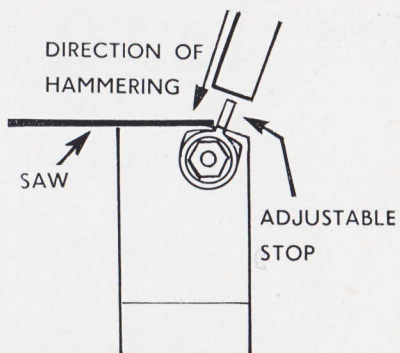


Fig. 11. Setting a saw by hand.

To conclude our remarks on setting, there are two main points to bear in mind:—

(1) *Never set teeth too far down.* In other words, do not bend over the whole of the tooth. A half or two-thirds down from the top of the tooth is sufficient. (Fig. 12.) Setting lower down the tooth leads to breakages.

(2) *Avoid excessive setting.* For the reasons explained above (Fig. 6), taper grinding of a craftsman's saw eliminates the need for much set. Oversetting may damage the teeth and increases the energy required in sawing.

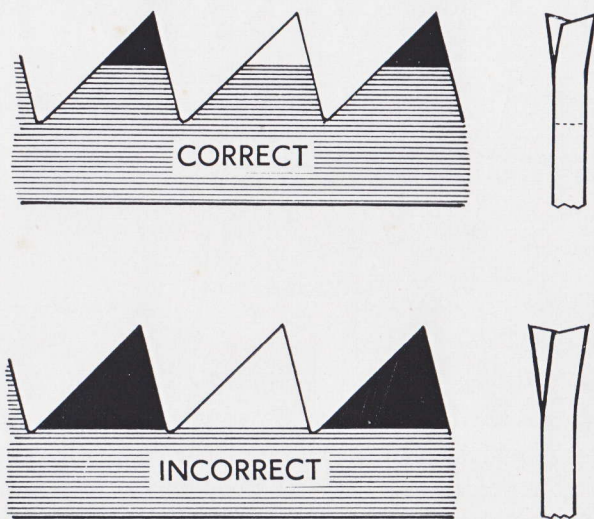


Fig. 12. Correct and incorrect setting.

Sharpening

A high grade saw is sent out by the manufacturers sharpened in one of two ways (a) fully cross-sharpened for cross-cutting, or (b) sharpened "straight through" for ripping.

Cross-sharpening (Fig. 13) produces the most effective tooth for cutting across the grain of wood.

Sharpening must always be done after setting or on a saw which has not lost its set. Use a taper saw file or double ended saw file of correct size for the pitch.

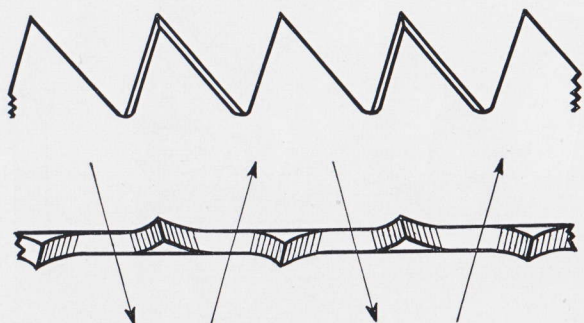


Fig. 13. Cross-sharpening.

First place the blade in a vice to grip about $\frac{1}{4}$ in. below the tooth gullets, with the handle of the saw to your right. Then stand facing the toe of the saw and insert the file in the gullet of the first tooth set towards you. Turn the point of the file somewhat towards the handle of the saw (Fig. 14) and with a few light strokes form the bevel on the front of the tooth set towards you and on the back of its neighbour, which is set away from you.

File in every *alternate* gullet in this way, working from toe to butt. Move the saw along periodically in the vice so that the part of the saw you are working on is held firmly.

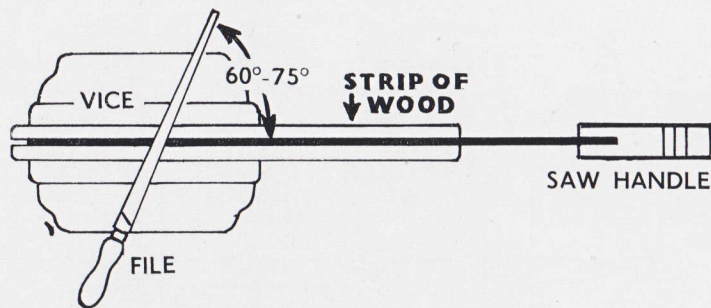


Fig. 14. Sharpening a cross-cut saw.

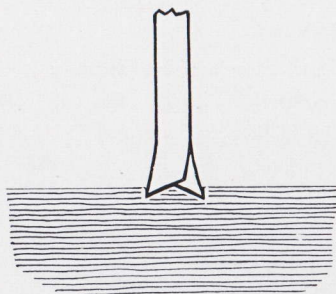
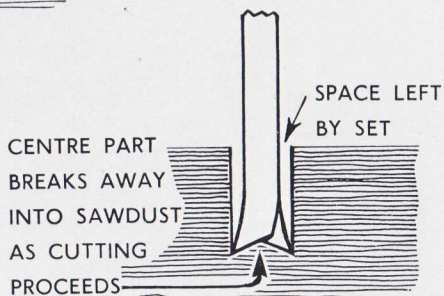


Fig. 15. Action of cross-cut saw. The points of the saw make two parallel cuts, severing the fibres.



Now turn the saw round with the handle to your left and file the remaining teeth.

The action of a cross-cut saw is clearly shown in Fig. 15.

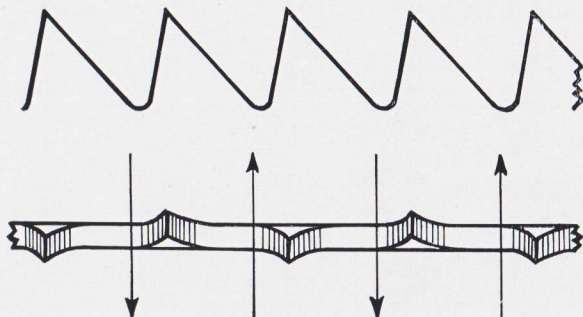


Fig. 16. Ripsaw teeth.

The teeth of a *ripping saw* are not sharpened obliquely into points as are those of a cross-cut. Ripsaw teeth (Fig. 16) are chisel shaped and shave off the wood in curls. (Fig. 17.)

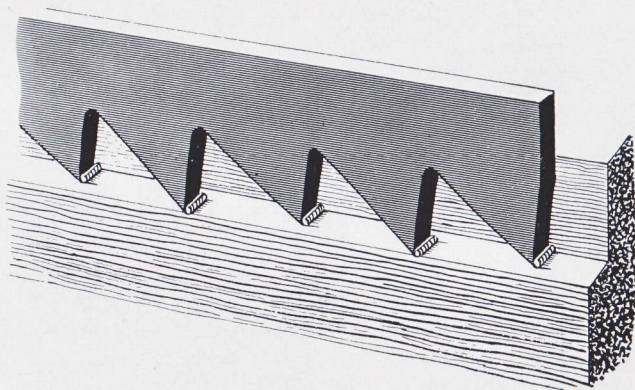


Fig. 17. Diagrammatic illustration showing action of ripsaw.

To sharpen, ripsaw teeth must be filed straight across. The procedure is similar to that used for sharpening a cross-cut, except that the file must be held at a right angle to the blade. (Fig. 18.)

Fix the saw in the vice as previously described and file every alternate tooth straight across, beginning from the toe and working towards the handle of the saw. Then reverse the saw in the vice and file the remaining teeth from the opposite side. This is a much better method than filing all the teeth from one side, and prevents the saw from running in the cut.

Take care not to file the bottoms of the gullets to an acute angle. When finished, the gullet bottoms should be slightly rounded.

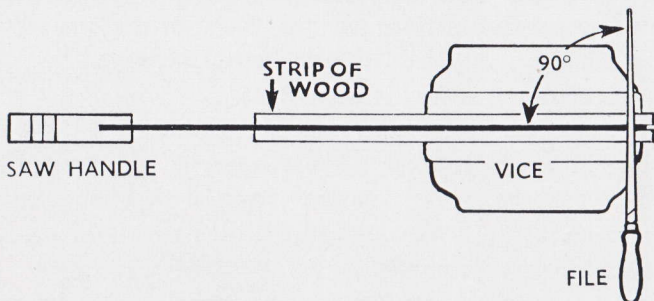
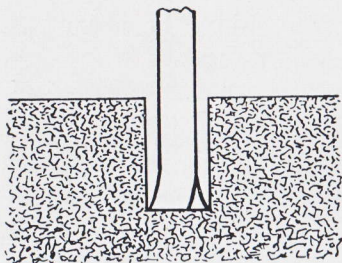


Fig. 18. Sharpening ripsaw.

Fig. 19. Cross-section of ripsaw tooth in cut. Compare the cross-cut tooth action (Fig. 15).



CHOOSING A SAW

The foregoing completes the notes on the maintenance and servicing of handsaws. Readers may now like to have further information to assist them when buying a saw, supplementary to the remarks made earlier in this book.

The craftsman will do well to study the diagram. (Fig. 1.) This illustrates the refinements obtainable in a first class saw. They add up to long and efficient service.

Go to a reliable dealer and select a saw bearing the trade mark of a reputable manufacturer.

You may prefer one of the lightweight pattern handsaws which have recently become very popular. These have a somewhat narrower and thinner blade than the regular pattern, one advantage being that they are less fatiguing to use, especially when much continuous sawing is being done.

In the best lightweight saws, such as the PAX DE LUXE, the saving in weight is made without impairing the strength or resilience of the saw, by the use of special steel and accurate tempering. Skilful tensioning and precision taper grinding add to the efficiency of this saw.

For the man who wants a saw for occasional work only, good quality saws are made by reputable manufacturers for a moderate price. "British" brand and "Crown" brand are examples of such saws.

An even cheaper saw may suit the man who only needs it for the occasional job about the household. Reputable manufacturers cater for this price range too. They use good steel but naturally such refinements as taper grinding and full cross sharpening are not incorporated in such saws. The "Newhall" brand is an example of a reliable saw of this type.

Very cheap saws sold at give-away prices are no good to anyone. They are invariably of low grade steel, have thin, soft and easily distorted blades, and will not retain their edge. Avoid them.

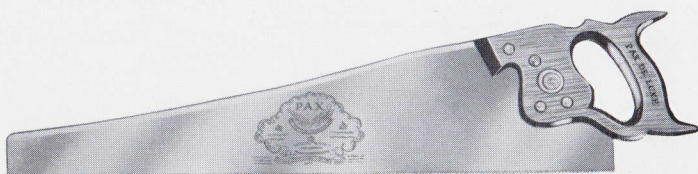
Saw Sizes

The handsaws in most general use are—

Panel	-22"	points per inch recommended - 10
Cross-cut	-24" or 26"	points per inch recommended - 6, 7 & 8
Rip	-28"	points per inch recommended - $4\frac{1}{2}$

The length of a saw is always measured from toe to butt and is exclusive of the handle.

Tooth size is stated in points per inch and marked on the blade at the butt end.



Pax de Luxe Lightweight Handsaw.



British Lightweight Handsaw.

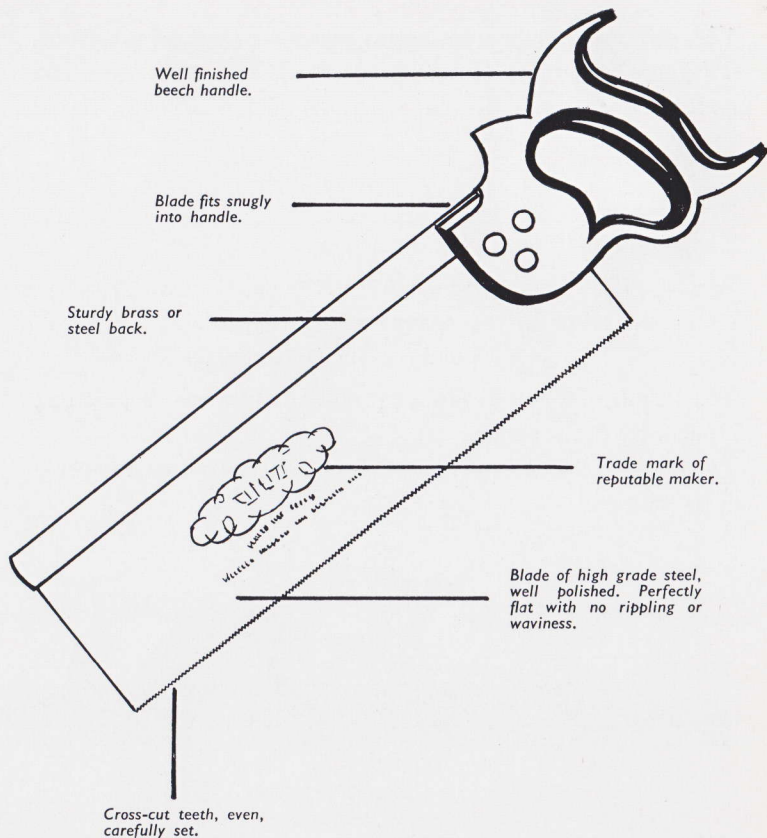


Fig. 20. Features of a high class tenon saw.

THE TENON SAW

The tenon or back saw is for the more fine, accurate work which cannot be attempted with a handsaw.

Tenon saws are normally made in 10", 12" and 14" blade sizes. The number of points per inch varies somewhat according to the standards set by different manufacturers. The following details apply to Sanderson tenon saws:—

10" saw, 15 points per inch. For the finest cabinet work.

12" saw, 13 points per inch. For cabinet work and the more accurate jobs arising in general joinery.

14" saw, 11 points per inch. For general joinery.

A smaller backsaw (8" blade with 15 or more points to the inch) is called a dovetail saw. This is for the very finest work.

The characteristics of a good quality tenon saw are shown in Fig. 20.

CARE AND MAINTENANCE

The notes on the general care and maintenance of handsaws also apply to tenon saws. Do not allow a saw to rust and preserve it from damage when not in use. The latter is especially important as a bent or buckled blade is prejudicial to good work. If teeth are broken, a great deal of filing will be necessary to get them all into shape again. A badly damaged tenon saw is best returned to the makers or a skilled saw doctor for attention.

SERVICING

Like a handsaw, a tenon saw should be serviced regularly for best results. Do not allow the saw to become noticeably blunt before filing.

COMPLETE OVERHAUL

The stages of a complete overhaul are exactly the same as for a handsaw and comprise topping, shaping, setting and sharpening. See relevant pages of this book, to which the following remarks may be added.

Because of the fineness of the teeth, even greater care is needed in servicing a tenon saw than with a handsaw.

10", 12" and 14" tenon saws are supplied with a general purpose tooth, i.e. one for cutting both with and across the grain. The teeth are cross-sharpened, but the leading edge of the tooth is made to lie back more than in the handsaw.

The 8" or dovetailed saw is filed straight through.

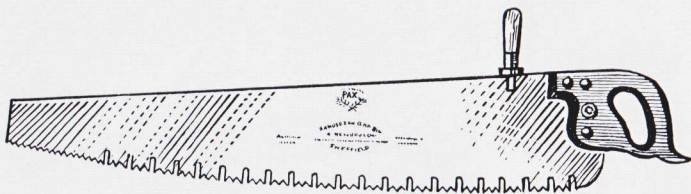
OTHER TYPES OF SAWS



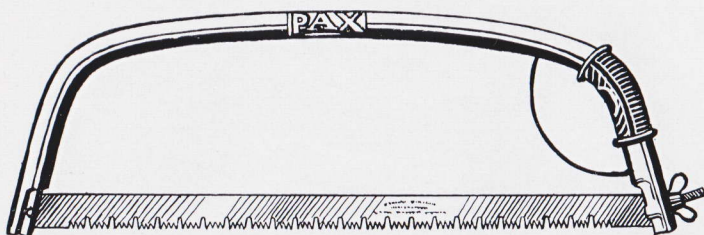
Cross-cut Saw. Used for felling timber and cutting heavy logs and baulks. Best types are ground thin to back. Two-man operation. Various types of teeth according to timber to be cut. Lengths 4 ft. to 7 ft.



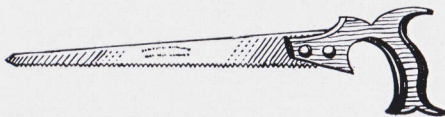
Felling Saw. A narrow pattern cross-cut saw used principally for felling. Best types are ground thin to back. Various types of teeth. Lengths 4 ft. to 7 ft.



One-Man Cross-cut Saw. This saw can be converted to two-man operation by adding a supplementary handle. Various teeth but "Great American" is the most usual. Lengths 3 ft. to 5 ft.



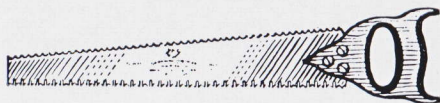
Tubular Frame Saw. Used about the farm or estate for cutting logs and green timber. Lengths 24", 30" and 36".



Compass Saw. A narrow saw used for small work. Length 10" to 20".

Double Edge Pruning Saw.

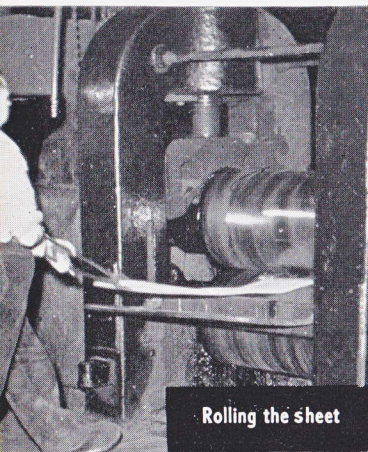
Handsaw teeth one side, for cutting twigs. Coarse "Lightning" tooth other side, for cutting branches.



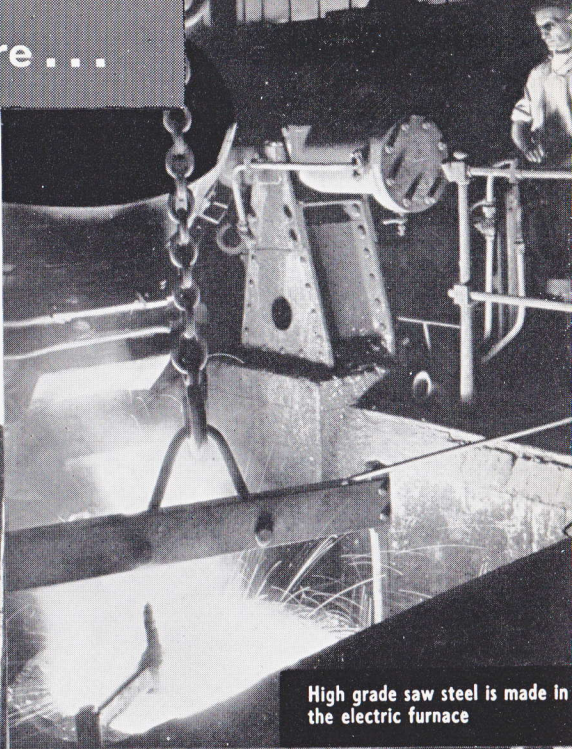
*All these saws are made by S. B. & N. Limited
Specify "PAX" for best quality.*

Saw Manufacture . . .

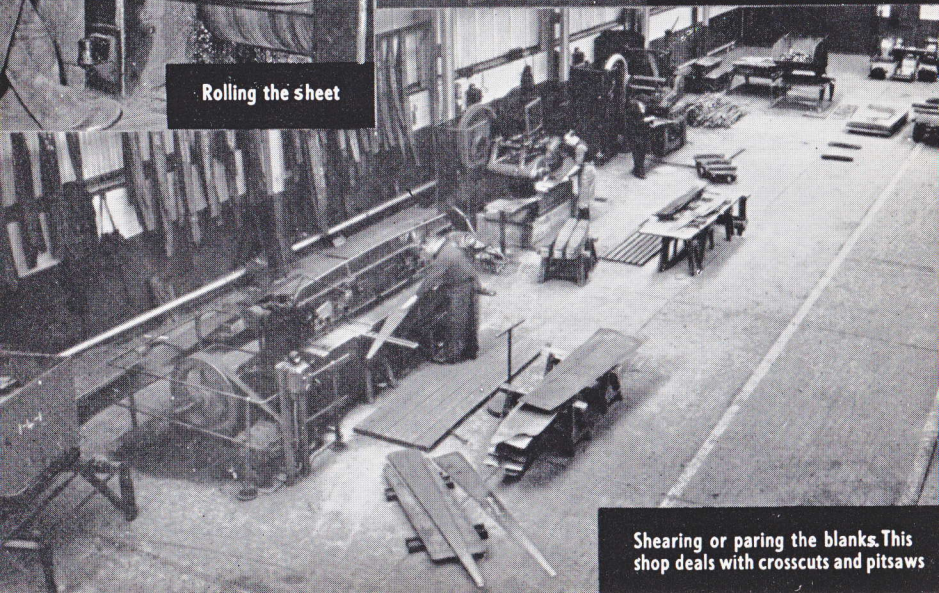
These photographs show some of the processes. In addition to the hand operated saws described in this book, Sanderson's make all types of saws including band and circular saws up to the largest sizes.



Rolling the sheet



High grade saw steel is made in the electric furnace

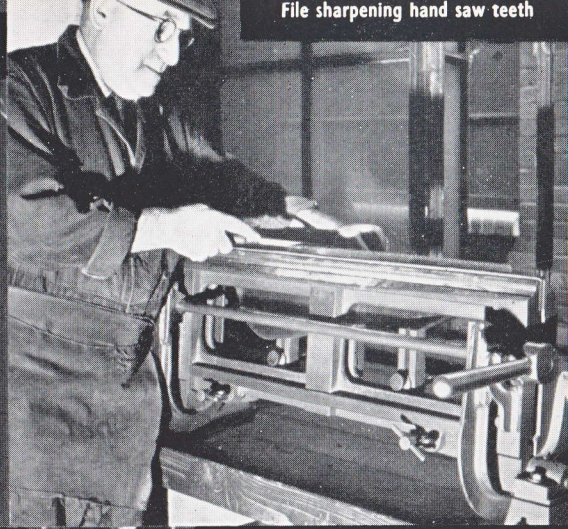


Shearing or paring the blanks. This shop deals with crosscuts and pitsaws

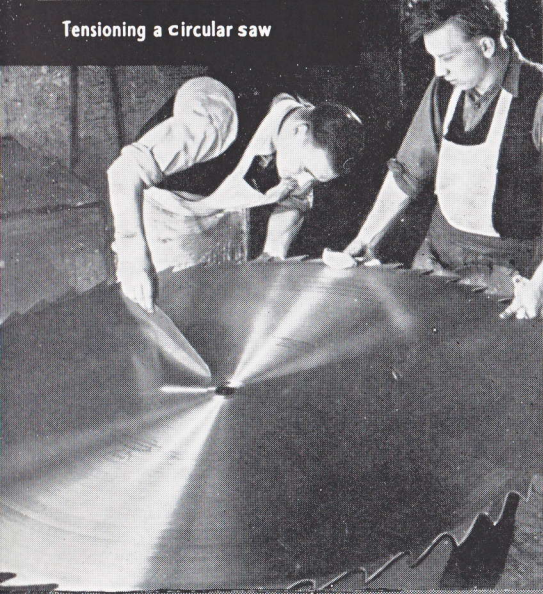
**Punching the teeth
in a pitsaw blank**



File sharpening hand saw teeth



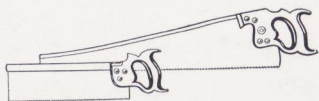
Tensioning a circular saw



Tensioning a large bandsaw



... at the Works of
SANDERSON BROTHERS AND NEWBOULD LIMITED



SANDERSON : SHEFFIELD